ENGINEERING ANALYSIS FOR
MINERAL MANUFACTURING CORPORATION
FACILITY NO. 601-0013-X011
EUFAULA, ALABAMA

Mineral Manufacturing Corporation (MMC) has applied to the ADEM – Air Division for a Synthetic Minor Operating Permit (SMOP), which would authorize the operation of an existing mineral processing facility located in Eufaula, Barbour County.

The SMOP would be issued for the following existing circuit:

X011 – 20 TPH Rotary Dryer/Cooler, Crushing, and Conveying Circuit with Baghouses

Circuit X011 would involve transferring bauxite clay or kaolin clay from active storage piles to a controlled flow apron feeder with conveyor. The clay material would then be conveyed to a primary double roll crusher and then to a secondary saw-toothed crusher. Both crushers would be utilized to reduce the size of the clay material for proper processing in the kiln. The crushed clay material from the secondary crusher would be conveyed through an additional controlled flow apron feeder with conveyor and on to another conveyor before being fed into an 8' x 200' rotary kiln. Once in the kiln, the clay material would be heated to an approximate temperature of 2000°F to remove all free moisture. Upon discharge from the kiln, the fired clay material would be transferred to a 6' x 61' rotary cooler for temperature reduction before being conveyed to a storage building, where the finished product would be stockpiled until sold. All equipment involved in this process would be controlled by an existing pulse type dust collector consisting of a series of four smaller baghouses that work in unison. The collection device has a designed removal efficiency of greater than 99%. There would be one stack affiliated with this control device making it the sole emission point for this facility.

This process would not be applicable to the following subparts of the New Source Performance Standards (NSPS):

1. Subpart LL – Standards of Performance for Metallic Mineral Processing Plants. This subpart would not apply to MMC because the proposed process would not meet the definition of *metallic mineral processing plant*.
2. Subpart OOO – Standards of Performance for Nonmetallic Mineral Processing Plants. This subpart would not apply to MMC because both crushers have a rated capacity of less than the 25 TPH standard for size reduction devices at fixed sand, gravel and crushed stone plants.
3. Subpart UU – Standards of Performance for Calciners and Dryers in Mineral Industries. This subpart would not apply to MMC because the rotary kiln was constructed and installed at its current location prior to the subpart applicability date of April 23, 1986. By definition, the rotary kiln has not undergone modification or reconstruction since its installation in the early 1960s.

Therefore, this process would be subject to the SIP rules and regulations. To avoid being a major source, MMC has requested to limit its potential to emit below the 100 TPY threshold for Title V sources and the 250 TPY threshold for Prevention of Significant Deterioration (PSD) sources. The requested limits are as follows:

1. A maximum of 8600 hours of operation during any twelve (12) month period (rolling average) shall be implemented to limit particulate emissions to 98.9 TPY. The hours of operation shall be maintained in a logbook to ensure that MMC does not exceed the maximum limit.
2. A maximum of 99 TPY of sulfur dioxide (SO_2) during any twelve (12) month period (rolling average) shall be implemented to limit SO_2 emissions. To ensure compliance with the SO_2 limit, MMC shall conduct a dry sulfur analysis on each batch of material processed at the plant. The percent sulfur determined by the analysis will be multiplied by the total mass of the material processed to calculate the pounds of sulfur within the material. It shall be assumed that 100% of the sulfur within the material will be converted to SO_2 and emitted out the stack. The sulfur analysis results and calculations shall be recorded for each batch. These records shall be maintained to ensure that MMC remains below the 99 TPY SO_2 limit.

According to previously submitted stack tests for MMC, the remaining criteria pollutants are not expected to exceed the Title V threshold. Please see Appendix A for the expected emissions at MMC.

This facility would not be located within 100 km of either a Class I Wilderness Area or a Nonattainment Area. Operation of this facility is not expected to significantly impact these areas.

This facility would not be considered "major" for any criteria pollutant and, therefore, is not required to undergo the PSD process. The Air Division will initiate a 15 day public comment period in order to solicit public input regarding the Department's preliminary determination to issue a SMOP to MMC.

This analysis indicates that this source would meet the requirements of all applicable rules and regulations of the ADEM - Air Division. Pending review and consideration of all technical comments received during the public input period, I recommend that a SMOP be issued to MMC, incorporating the provisions of Appendix A and Appendix B, and the cover letter.

Tamara N. Roberts
Energy Branch
Air Division

November 30, 2009
DATE

APPENDIX A
CALCULATIONS FOR
MINERAL MANUFACTURING CORPORATION
601-0013-X011

Rated Capacity: 20 TPH

Control Equipment: Four Baghouses with One Stack

Hours of Operation: 8600 hrs/year (proposed synthetic minor limit)

PARTICULATE EMISSIONS

Allowable: Allowable particulate emissions rate based on process weight equation in ADEM Admin. Code r. 335-3-4-.04

$E = 3.59\ P^{0.62}$ where $P < 30$ TPH
$E = 3.59\ (20\ TPH)^{0.62}$
$E = (3.59)(6.40) =$ **23 lbs/hr**

OR

23 lbs / hour	8760 hours / year	ton / 2000 lbs	= **100.7 TPY**

To avoid being a Title V source, MMC has requested an hourly limitation of 8600 hours per any twelve (12) month (rolling average) period. Therefore, the calculations for the SMOP limitation are detailed below.

23 lbs / hour	8600 hours / year	ton / 2000 lbs	= **98.9 TPY**

Rotary Kiln / Cooler

Uncontrolled: Emission factor of 120 lbs/ton from AP-42, Table 11.5-2 (Refractory Manufacturing) and 11.25-7 (Fire Clay Processing)

20 tons / hour	120 lbs / ton	= 2400 lbs/hr

Controlled: Assuming a baghouse control efficiency of 99.5%

2400 lbs / hour	0.005 (99.5% efficiency)	= 12 lbs/hr

Expected: Calculated using the proposed 8600 hours of operation per year

12 lbs / hour	8600 hours / year	ton / 2000 lbs	= **51.6 TPY**

Primary and Secondary Crushers

Uncontrolled: Emission factor of 0.0054 lbs/ton from AP-42, Table 11.19.2-2

20 tons / hour	0.0054 lbs / ton	= 0.108 lbs/hr

Controlled: Assuming a baghouse control efficiency of 99.5%

0.108 lbs / hour	0.005 (99.5% efficiency)	= 0.00054 lbs/hr

Expected: Calculated using the proposed 8600 hours of operation per year

0.00054 lbs / Hour	8600 Hours / Year	Ton / 2000 lbs	= 0.0023 TPY

0.0023 TPY x 2 crushers= **0.0046 TPY**

Conveyors

Uncontrolled: Emission factor of 0.0054 lbs/ton from AP-42, Table 11.19.2-2

20 Tons / Hour	0.003 lbs / Ton	= 0.06 lbs/hr

Controlled: Assuming a baghouse control efficiency of 99.5%

0.06 lbs / Hour	0.005 (99.5%)	= 0.0003 lbs/hr

Expected: Calculated using the proposed 8600 hours of operation per year

0.0003 lbs / Hour	8600 Hours / Year	Ton / 2000 lbs	= 0.0013 TPY

0.0013 TPY x 8 (6 conveyors and 2 feeders) = **0.0104 TPY**

Total Expected Particulate Emissions

Rotary Kiln / Cooler	51.6 TPY
Crushers	0.0046 TPY
Conveyors	0.0104 TPY
TOTAL:	**51.62 TPY**

FUEL SOURCE CALCULATIONS

Fuel Type: Natural Gas

Heat Input Capacity: 40 MMBTU/hr

Heat Content: 1020 BTU/ft^3

PM Emissions

Allowable: Allowable particulate emissions based on heat input in ADEM Admin. Code r. 335-3-4-.03

$E = 1.38\ H^{-0.44}$ where H = Heat input in millions of BTU/hr
$E = 1.38\ (40\ MMBTU/hr)^{-0.44}$
$E = (1.38)(0.197) =$ **0.27 lbs/MMBTU**

0.27 lbs	40 MMBTU	= **10.8 lbs/hr**
MMBTU	hour	

OR

10.8 lbs	8760 hours	ton	= **47.30 TPY**
hour	year	2000 lbs	

Expected: Emission factor of 7.6 lbs/MMSCF from AP-42; Table 1.4-2

7.6 lbs	ft^3	40 MMBTU	= 0.30 lbs/hr
10^6 ft^3	1020 BTU	Hour	

0.30 lbs	8600 Hours	Ton	= **1.29 TPY**
Hour	Year	2000 lbs	

SO_2 Emissions

Allowable: The SIP allowable for this process would be *4 lbs per million BTU heat input.* However, this facility would be limited to the utilization of natural gas, and the subsequent emissions would be negligible.

Expected: Emission factor of 0.6 lbs/MMSCF from AP-42; Table 1.4-2

0.6 lbs	ft^3	40 MMBTU	= 0.02 lbs/hr
10^6 ft^3	1020 BTU	hour	

0.02 lbs	8600 hours	ton	= **0.09 TPY**
Hour	year	2000 lbs	

NOx Emissions

Allowable: There is no allowable NOx emissions rate limiting this process.

Expected: Emission factor of 100 lbs/MMSCF from AP-42; Table 1.4-1

100 lbs / 10^6 ft^3	ft^3 / 1020 BTU	40MMBTU / Hour	= 3.92 lbs/hr
3.92 lbs / Hour	8600 Hours / Year	Ton / 2000 lbs	= **16.86 TPY**

CO Emissions

Allowable: There is no allowable CO emissions rate limiting this process.

Expected: Emission factor of 84 lbs/MMSCF from AP-42; Table 1.4-1

84 lbs / 10^6 ft^3	ft^3 / 1020 BTU	40 MMBTU / Hour	= 3.29 lbs/hr
3.29 lbs / Hour	8600 Hours / Year	Ton / 2000 lbs	= **14.15 TPY**

VOC Emissions

Allowable: There is no allowable VOC emissions rate limiting this process.

Expected: Emission factor of 5.5 lbs/MMSCF from AP-42; Table 1.4-2

5.5 lbs / 10^6 ft^3	ft^3 / 1020 BTU	40 MMBTU / Hour	= 0.22 lbs/hr
0.22 lbs / Hour	8600 Hours / Year	Ton / 2000 lbs	= **0.95 TPY**

Expected Facility Calculation Totals at the Proposed 8600 hours/year

Pollutant	Equipment (TPY)	Basis of Calculation	*Fuel (TPY)	TOTAL:
PM	51.60	AP-42	1.29	**52.89 TPY**
SO_2	98.91	SMOP limitation	0.09	**99.00 TPY**
NOx	17.20	Stack Test Results	16.86	**34.06 TPY**
CO	7.22	Stack Test Results	14.15	**21.37 TPY**
VOC	1.25	Stack Test Results	0.95	**2.20 TPY**

**All expected emissions for the natural gas fuel source were calculated using AP-42 emission factors.*

MINERAL MANUFACTURING CORPORATION
EUFAULA, ALABAMA
PERMIT NO. 601-0013-X011
PROPOSED PROVISOS

1. This permit is issued on the basis of Rules and Regulations existing on the date of issuance. In the event additional Rules and Regulations are adopted, it shall be the permit holder's responsibility to comply with such rules.

2. This permit is not transferable. Upon sale or legal transfer, the new owner or operator must apply for a permit within 30 days.

3. A new permit application must be made for new sources, replacements, alterations or design changes which may result in the issuance of, or an increase in the issuance of, air contaminants, or the use of which may eliminate or reduce or control the issuance of air contaminants.

4. In case of shutdown of air pollution control equipment for scheduled maintenance for a period greater than one (1) hour, the intent to shut down shall be reported to the Department at least 24 hours prior to the planned shutdown, unless accompanied by the immediate shutdown of the emission source.

5. In the event there is a breakdown of equipment in such a manner as to cause increased emission of air contaminants for a period greater than one (1) hour, the person responsible for such equipment shall notify the Department within an additional 24 hours and provide a statement giving all pertinent facts, including the duration of the breakdown. The Department shall be notified when the breakdown has been corrected.

6. This process, including all air pollution control devices and capture systems for which this permit is issued shall be maintained and operated at all times in a manner so as to minimize the emissions of air contaminants. Procedures for ensuring that the above equipment is properly operated and maintained so as to minimize the emission of air contaminants shall be established.

7. This permit expires and the application is canceled if construction has not begun within 24 months of the date of issuance of the permit.

8. On completion of construction of the device(s) for which this permit is issued, written notification of the fact is to be submitted to the Chief of the Air Division. The notification shall indicate whether the device(s) was constructed as proposed in the application. The device(s) shall not be operated until authorization to operate is granted by the Chief of the Air Division. Failure to notify the Chief of the Air Division of construction and/or operation without authorization could result in revocation of this permit.

9. Prior to a date to be specified by the Chief of the Air Division in the authorization to operate, emission tests are to be conducted by persons familiar with and using the EPA Sampling Train and Test Procedure as described in the Code of Federal Regulations, Title 40, Part 60, for the following pollutants. Written tests results are to be reported to the Air Division within 15 working days of completion of testing.

Particulates	(X)	Carbon Monoxide	(X)
Sulfur Dioxide	(X)	Nitrogen Oxides	(X)
Volatile Organic Compounds	(X)	Visible Emissions	(X)

10. Submittal of other reports regarding monitoring records, fuel analyses, operating rates, and equipment malfunctions may be required as authorized in the Department's air pollution control rules and regulations. The Department may require stack emission testing at any time.

11. Additions and revisions to the conditions of this Permit will be made, if necessary, to ensure that the Department's air pollution control rules and regulations are not violated.

12. Nothing in this permit or conditions thereto shall negate any authority granted to the Department pursuant to the Alabama Environmental Management Act or regulations issued thereunder.

13. This permit is issued with the condition that, should obnoxious odors arising from the plant operations be verified by Air Division inspectors, measures to abate the odorous emissions shall be taken upon a determination by the Alabama Department of Environmental Management that these measures are technically and economically feasible.

14. The Air Division must be notified in writing at least 10 working days in advance of all emission tests to be conducted and submitted as proof of compliance with the Department's air pollution control rules and regulations.

    To avoid problems concerning testing methods and procedures, the following shall be included with the notification letter:

    (a) The date the test crew is expected to arrive, the date and time anticipated of the start of the first run, how many and which sources are to be tested, and the names of the persons and/or testing company that will conduct the tests.

    (b) A complete description of each sampling train to be used, including type of media used in determining gas stream components, type of probe lining, type of filter media, and probe cleaning method and solvent to be used (if test procedure requires probe cleaning).

(c) A description of the processes to be tested, including the feed rate, any operating parameter used to control or influence the operations, and the rated capacity.

(d) A sketch or sketches showing sampling point locations and their relative positions to the nearest upstream and downstream gas flow disturbances.

A pretest meeting may be held at the request of the source owner or the Department. The necessity for such a meeting and the required attendees will be determined on a case-by-case basis. All test reports must be submitted to the Air Division within 15 days of the actual completion of the test, unless an extension of time is specifically approved by the Air Division.

15. Precautions shall be taken to prevent fugitive dust emanating from plant roads, grounds, open and enclosed stockpiles, building openings, process equipment, ductwork, etc.

Plant or haul roads and grounds shall be maintained in the following manner so that dust will not become airborne. A minimum of one, or a combination, of the following methods shall be utilized to minimize airborne dust from plant or haul roads and grounds:

(a) by the application of water any time the surface of the road is sufficiently dry to allow the creation of dust emissions by the act of wind or vehicular traffic;

(b) by reducing the speed of vehicular traffic to a point below that at which dust emissions are created;

(c) by paving;

(d) by the application of binders to the road surface at any time the road surface is found to allow the creation of dust emissions;

Should one, or a combination, of the above methods fail to adequately reduce airborne dust from plant or haul roads and grounds, alternative methods shall be employed, either exclusively or in combination with one or all of the above control techniques, so that dust will not become airborne. Alternative methods shall be approved by the Department prior to utilization.

16. A properly maintained and operated device shall be utilized to measure the pressure differential across the baghouse.

17. Any performance tests required shall be conducted and data reduced in accordance with the test methods and procedures contained in each specific permit condition unless the Director (1) specifies or approves, in specific cases, the use of a reference method with minor changes in methodology, (2) approves the use of an equivalent method, or (3) approves the use of an alternative method, the results of which he has determined to be adequate for indicating whether a specific source is in compliance.

18. This process is subject to the rules and regulations of the State Implementation Plan (SIP). All particulate emissions generated by the operation of the rotary kiln/cooler, crushers, and conveyors shall be minimized by an air pollution control device.

19. The permittee shall not use as a defense in an enforcement action that maintaining compliance with conditions of this permit would have required halting or reducing the permitted activity.

20. The issuance of this permit does not convey any property rights of any sort, or any exclusive privilege.

21. Any source of particulate emissions shall not discharge more than one six (6) minute average opacity greater than 20% in any sixty (60) minute period. At no time shall any source discharge a six (6) minute average opacity of particulate emission greater than 40%. Opacity shall be determined by 40 CFR Part 60, Appendix A, Method 9.

22. This facility is limited to the use of natural gas only as a fuel to fire the burner. Any plans to change the type of burner fuel must receive prior approval from the Department.

23. Dust emissions created by the operation of the rotary kiln/cooler, crushers, and conveyors shall be ducted to an air pollution control device. Dust emissions shall not be allowed to escape from enclosures or through seals due to holes or cracks in the enclosures or seals or due to inadequate or poor draft caused by leaks, blockages, or fan malfunctioning. Holes or cracks in enclosures or seals and/or inadequate or poor draft which allow dust emissions to escape the enclosures and/or seals must be promptly repaired.

24. This process shall not operate more than 8,600 hours per year during any consecutive twelve (12) month period (rolling average). Records of hours of operation must be kept in permanent form suitable for inspection and made available upon request. These records shall be retained on site for at least two (2) years from the date of generation.

Permit Number: 601-0013-X011

25. This process shall not exceed 99 tons per year of sulfur dioxide (SO_2) emissions during any consecutive twelve (12) month period (rolling average). A dry sulfur analysis shall be conducted on each batch of material processed at the facility. The analytical method used to determine the percent sulfur within each batch and the laboratory used to conduct the testing must be approved by the Air Division. The percent sulfur within each batch shall be calculated with the total mass of material in the batch to determine the amount of SO_2 being emitted from the stack, assuming that 100% of the sulfur within the material is converted into SO_2. Sulfur records and analysis must be kept in permanent form suitable for inspection and made available upon request. The records and analysis shall be retained on site for at least two (2) years from the date of generation.

26. Should this facility, at any time, exceed the limits for hours of operation or SO_2 emissions, the Department must be notified within ten (10) days of the exceedance.

27. Precautions shall be taken by the permittee and its personnel to ensure that no person shall ignite, cause to be ignited, permit to be ignited, or maintain any open fire in such a manner as to cause the Department's rules and regulations applicable to open burning to be violated.

TBA
Date

ONIS "TREY" GLENN, III
DIRECTOR

BOB RILEY
GOVERNOR

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TBA

MR THOMAS REED, SR
MINERAL MANUFACTURING CORP
9751 REED ROAD
HUNTINGDON PA 16652

RE: Facility No. 601-0013-X011

Dear Mr. Reed, Sr.:

The enclosed Air Permit is issued pursuant to the Department's air pollution control rules and regulations. Please note the conditions (provisions) which must be met in order to retain this Air Permit.

New sources of air pollution receiving approval by an Air Permit must notify the Chief of the Air Division upon completion of construction and prior to operation. Authorization to Operate must then be received from the Chief of the Air Division. Failure to notify the Chief of the Air Division upon completion of construction and/or operation without authorization can result in the revocation of the Air Permit.

Upon receiving the enclosed Air Permit, please review **all** of the provisions.

Should you have any questions or if clarification of permit conditions is required, please do not hesitate to contact Tamara Roberts at (334) 271-7865 in Montgomery.

Sincerely,

Ronald W. Gore, Chief
Air Division

RWG/tnr

Enclosures

Birmingham Branch
110 Vulcan Road
Birmingham, AL 35209-4702
(205) 942-6168
(205) 941-1603 (Fax)

Decatur Branch
2715 Sandlin Road, S.W.
Decatur, AL 35603-1333
(256) 353-1713
(256) 340-9359 (Fax)

Mobile Branch
2204 Perimeter Road
Mobile, AL 36615-1131
(251) 450-3400
(251) 479-2593 (Fax)

Mobile - Coastal
4171 Commanders Drive
Mobile, AL 36615-1421
(251) 432-6533
(251) 432-6598 (Fax)

ADEM
Alabama Department of Environmental Management

AIR PERMIT

PERMITTEE: MINERAL MANUFACTURING CORPORATION

FACILITY NAME: MINERAL MANUFACTURING CORPORATION

LOCATION: EUFAULA, ALABAMA

PERMIT NUMBER	DESCRIPTION OF EQUIPMENT, ARTICLE OR DEVICE
601-0013-X011	20 TPH Rotary Kiln/Cooler, Crushing, and Conveying Circuit with Baghouses

In accordance with and subject to the provisions of the Alabama Air Pollution Control Act of 1971, as amended, Ala. Code §§22-28-1 to 22-28-23 (2006 Rplc. Vol and 2007 Cum. Supp..) (the "AAPCA") and the Alabama Environmental Management Act, as amended, Ala. Code §§22-22A-1 to 22-22A-15 (2006 Rplc. Vol and 2007 Cum. Supp..), and rules and regulations adopted there under, and subject further to the conditions set forth in this permit, the Permittee is hereby authorized to construct, install and use the equipment, device or other article described above.

ISSUANCE DATE: DRAFT

Alabama Department of Environmental Management